5-1-2010

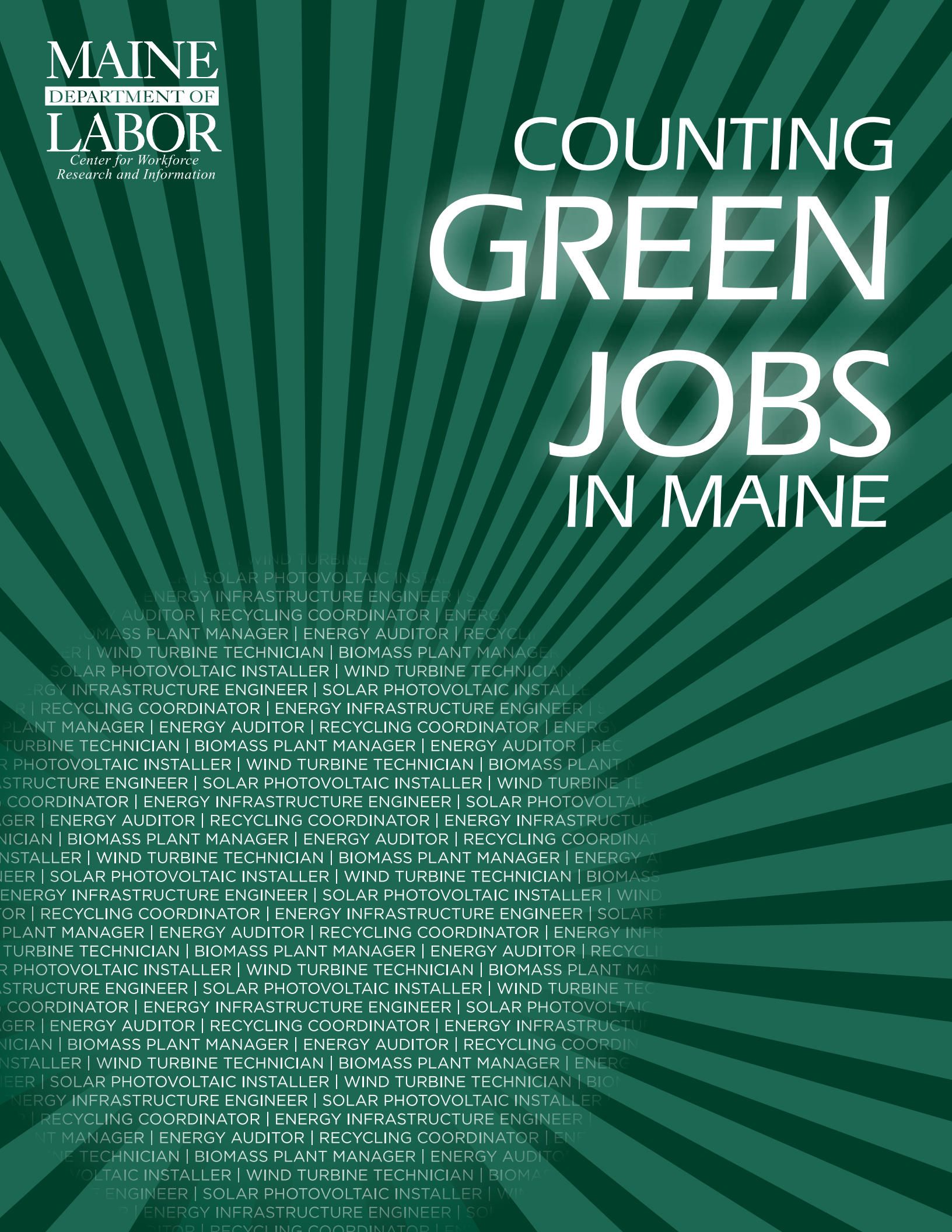
Counting Green Jobs in Maine, 2010

Maine Center for Workforce Research and Information

Maine Department of Labor

MAINE
DEPARTMENT OF
LABOR
Center for Workforce Research and Information

COUNTING GREEN JOBS IN MAINE



JOHN ELIAS BALDACCI
GOVERNOR

STATE OF MAINE
DEPARTMENT OF LABOR
CENTER FOR WORKFORCE RESEARCH AND INFORMATION
45 COMMERCE DRIVE
AUGUSTA, MAINE
04330

LAURA A. FORTMAN
COMMISSIONER

JOHN DORRER
DIVISION DIRECTOR

Counting Green Jobs in Maine

A Publication of:
Center for Workforce Research and Information
Maine Department of Labor

Prepared by:
Ruth Pease and Dana Evans

Issued February 2010
Augusta, Maine

PHONE: (207) 623-7900 TTY 1-800794-1110 FAX: (207) 287-2947

Telephone: (207) 623-7900 TTY: 1-800-794-1110 Fax: (207) 287-2947

Preface

Maine's economy has been hit hard by what has been termed the "deepest recession since the Great Depression". With the loss of over 30,000 payroll jobs and a dramatic increase in the number of unemployed workers during 2008 and 2009, it is reasonable to ask about where future job growth will come from. Over the last year, the media, environmental advocates, trade groups, and public policymakers have heralded the emergence of green jobs and industries. We do in fact have deepening commitment to environmental conservation, renewable energy development, and increased energy efficiency measures through funding under the American Recovery and Reinvestment Act and investments by private industry. We can safely assume that job creation is already and will continue to be one of the consequences from these investments.

There is much debate about counting green jobs and defining green industries however. A steady release of studies from government, industry, and advocates have attempted to provide job counts and make projections. There will certainly be more studies and claims. Hopefully, we are heading towards greater definitional consistency by charging the Nation's official employment statistics agency to develop official definitions. The U.S Department of Labor, Bureau of Labor Statistics, is undertaking an effort to define green industries by early next year and will be collecting data on new and emerging green occupations between 2010 and 2014. Once completed, we should be able to see more reliable and consistent data for analysis.

Meanwhile, the Maine Department of Labor is trying to fill some of the informational voids. We are attempting to identify green firms and jobs in Maine and to provide estimates of employment size and change in support of public and private investments. The six New England states, New York, and New Jersey, are pursuing a regional approach to the identification and analysis of green jobs. These efforts are a" work in progress" and we fully expect to modify our methodologies and update our employment estimates as better information and definitional clarity becomes available.

The Maine Department of Labor, Center for Workforce Research and Information, is committed to examining the dynamics of Maine's economy and the associated impacts on the workforce and labor markets in helping to chart a more prosperous future for all Maine citizens.

John Dorrer, Director
Center for Workforce Research and Information
Maine Department of Labor

Table of Contents

Purpose of This Report

The purpose of this report is to provide information on green jobs in Maine. The green economy is currently evolving within rapidly changing economic conditions, making it difficult even under the best of circumstances to accurately measure the number of green jobs. Rather than a final statement, this report reflects a process moving towards useful measurement of green jobs.

There is much speculation these days about job creation associated with the emergent green economy. Billions of new public and private investments are making our households, businesses, and industry more energy efficient. Renewable energy coming from a combination of wind power, bio fuels, solar, and the oceans is projected to become an increasing share of the world's energy sources. Environmental cleanup and protection are fundamental to survival and are being held up as potential source of future job growth.

Advocacy groups, business and trade associations, and government agencies together have published countless studies and reports mostly speculating on the shape and quantity of jobs that will be created in the new green economy. Speculation and enthusiasm, however, are not sufficient for guiding critical education and training investment decisions needed to supply future workforce needs.

Traditional employment estimates and occupational projections are grounded in historical patterns, making it difficult to incorporate technological innovation, recent market developments, and the impacts of public policies. The failure to effectively capture employment trends and developments could result in preparing either too few or too many workers to meet the needs of rapidly evolving sectors of the economy. While efforts are underway at the U.S. Department of Labor to identify green industries and occupations within traditional industry and occupational coding systems, it will take some time before these bear fruit. In the interim, the Maine Department of Labor will pursue alternative methods for estimating employment developments in the green economy.

Defining Green Jobs

With the increased activity in, and funding for, green economic activities, interest in defining and counting green jobs has grown. Making the job more difficult is the blurring of lines between green and non-green jobs as jobs green in general.

The Workforce Information Council Green Jobs Study Group (a cooperative effort by the U.S. Department of Labor and state agencies responsible for collecting employment data) recently published a suggested definition of green jobs which is:

> "…one in which the work is essential to providing products or services that improve energy efficiency, expand the use of renewable energy, or support environmental sustainability. The job involves work in any of the green economic activity categories:
>
> - Renewable Energy and Alternative Fuels
> - Energy Efficiency and Conservation
> - Pollution, Waste and GHG Management, Prevention and Reduction
> - Environmental Cleanup and Remediation and Waste Cleanup and Mitigation
> - Sustainable Agriculture and Natural Resource Conservation
> - Education, Regulation, Compliance, Public Awareness and Training and Energy Trading."

The U.S. Department of Labor, Bureau of Labor Statistics, is working through definitions and approaches that are specific to a national survey to estimate the number of green jobs. At the same time, many states have undertaken independent studies. In light of these activities, the Study Group acknowledged that many issues remain and proposed that work continue on refining definitions and data collection methods based on best state practices.

Green Job Estimates for Selected States

Many other state labor market information units have developed green job definitions and estimates, four of which are summarized below. Definitions vary between the states, with renewable energy and energy efficiency being common to all four. These states conducted a survey of employers which provided a sample-based count of green jobs. The number of green jobs ranged from 1.6 percent of private employment in Washington to 3.2 percent in Oregon.

Green Jobs as a Percent of Private Employment*	
California	INA
Michigan	3.0%
Oregon	3.2%
Washington	1.6%
*Direct	

Washington defined the private green economy as rooted in the development and use of products that promote environmental protection and energy security. It is composed of industries engaged in energy efficiency, renewable energy, preventing and reducing pollution, and mitigating or cleaning up pollution. Direct employment was measured; .jobs that supported these efforts such as accounting, clerical, and human services were not counted.

Michigan defined the private green economy as being comprised of industries that provide products or services in agricultural and natural resource conservation, clean transportation and fuels, increased energy efficiency, pollution prevention or environmental cleanup, and renewable energy production. Green jobs were jobs directly involved in generating or supporting a firm's green-related products or services.

Oregon defined a green job as one that provides a service or produces a product in increasing energy efficiency; producing renewable energy; preventing, reducing, or mitigating environmental degradation; cleaning up and restoring the natural environment; and providing education, consulting, policy promotion, accreditation, trading and offsets, or similar services supporting categories one through four. All industries, private and government, were surveyed. Green jobs were jobs directly involved in generating a firm's green-related products or services.

California defined as green any activity or services that performed at least one of the following: generating and storing renewable energy; recycling existing materials; energy efficient product manufacturing, distribution, construction, installation, and maintenance; education, compliance, and awareness; and natural and sustainable product manufacturing. All industries were surveyed.

Summary –As might be expected, many of the green jobs in these states were found in the construction industry, reflecting an emphasis on increasing energy efficiency. Green jobs were also concentrated based on the industrial structure of the state. In California, crop and food production accounted for many green jobs. A large proportion of green jobs in Washington came from agriculture-related industries. Oregon green jobs tended to be concentrated in industries related to production, and natural resources. Automobile manufacturing and related industries provided many of the green jobs in Michigan.

While a number of issues arise from the use of surveys to measure green jobs, including timing, definitions, and employer-response subjectivity, perhaps the overriding concern is cost. Not only is conducting a survey relatively expensive, its usefulness would be linked to some degree upon a continuous survey process to measure change over time.

Existing Studies on Maine Green Jobs

A number of studies have been published attempting to measure green jobs in Maine; two are summarized below. Estimates of green jobs in Maine differ significantly based on the definition of green jobs and methodologies used to develop the estimates.

Perhaps the most extensive study of green jobs was conducted by the PEW Charitable Trusts for all fifty states. They defined the clean energy economy as one that generates jobs, businesses, and investments while expanding clean energy production, increasing energy efficiency, reducing green house gas emissions, waste and pollution, and conserving water and natural resources. The clean energy economy cuts across five categories: (1) clean energy; (2) energy efficiency; (3) environmentally friendly production; (4) conservation and pollution mitigation; and (5) training and support. PEW estimated that Maine had 6,000 clean energy jobs in 2007. Job counts reflected direct and support green jobs.

Global Insights published a 2008 report entitled *U.S. Metro Economies – Current and Potential Green Jobs* in the U.S. Economy. Green activities included any activity that generates electricity using renewable or nuclear fuels, agricultural jobs supplying corn or soy for transportation fuel, manufacturing jobs producing goods used in renewable power generation, equipment dealers and wholesalers specializing in renewable energy or energy-efficient products, construction and installation of energy and pollution management systems, government administration of environmental programs, and supporting jobs in the engineering, legal, research, and consulting fields. Global Insights estimated there were 1,569 green jobs in Maine's metropolitan areas for 2006. Job counts reflected direct and support green jobs.

Maine Department of Labor Green Job Estimates

The Maine Department of Labor has approached counting green jobs by industry, occupation, and firm.

Industry - The Center for Workforce Research and Information made an initial attempt to develop a working definition of green jobs and green industries and a strategy for counting them, which was published in "Maine's Green Economy: An Overview of Renewable Energy and Energy Efficiency sectors." The industry profile employed by Global Insight Inc. in their 2008 report for the United State Conference of Mayors and the Mayors Climate Protection Center entitled "Current and Potential Green Jobs in the U.S. Economy" for measuring Maine's green jobs was used.

This definition focuses more narrowly than some others on energy efficiency and renewable energy activities. Using Global Insight's industry breakdown as a starting point, the industry list was modified based on Maine's mix of economic activity. The result is a list of 73 6-digit North American Industry Classification System (NAICS) codes from 11 industry sectors representing average employment of 45,817 workers in 2008, approximately 8 percent of wage and salary jobs in Maine.

This industry approach to measuring green jobs by identifying and tracking whole industries has significant weaknesses. First, it assumes the validity of the concept of a green industry, when we know, for example, that not all firms in the building construction industry build energy efficient buildings. Also, all jobs within the firm/industry are considered green; there is no differentiation between accountants, office assistants, and a solar panel installer. And finally, green jobs are not confined to firms working in green industries. Unfortunately, green business activities do not conform well to existing industry classifications based on NAICS codes.

Occupation - The U.S. Department of Labor, Employment and Training Administration (ETA), has researched the impact of green economy activities and technologies on occupational requirements in order to determine their impact on current occupations and identify new and emerging occupations. ETA's focus was on the "greening" of occupations; that is, "… the extent to which green economy activities and technologies increase the demand for existing occupations, shape the work and worker requirements needed for occupational performance, or generate unique work and worker requirements."

Using this definition, the ETA specified three occupational categories of green jobs:

(1) Green increased demand occupations, where there is an increase in the demand for an existing occupation. However, this impact does not entail significant changes in the work and worker requirements of the occupation.

(2) Green enhanced skills occupations, where there is a significant change to the work and worker requirements for an existing occupation, while the essential purposes of the occupation remain the same.

(3) Green new and emerging occupations where the impact of green economy activities and technologies creates unique work and worker requirements resulting in the generation of a new occupation.

Twelve green economy sectors were selected and researched to determine the level of occupational greening within the sectors. The 12 sectors consist of:

- Renewable Energy Generation
- Energy Efficiency
- Energy Trading
- Research, Design and Consulting
- Agriculture and Forestry
- Recycling and Waste Reduction
- Transportation
- Green Construction
- Energy and Carbon Capture
- Environment Protection
- Manufacturing
- Governmental and Regulatory

There were 64 Standard Industrial Code (SOC) occupations identified as increased demand green occupations, 60 identified as enhanced skill occupations, and 91 identified as new and emerging occupations. For those wanting a list of these occupations matched to data collected by the Maine

Department of Labor, please contact the Center for Workforce Research and Information. The specificity of data collected at the statewide level does not match that collected at the national level. For example, employment data for the SOC occupation wind turbine electrical engineer is collected and assigned to the much broader SOC code electrical engineer in Maine. This makes measurement of many green occupations identified by ETA problematic at the statewide level.

All three green occupational categories will likely be found to varying degrees in most of the green economy sectors according to ETA. For example, in the renewable energy generation sector, occupations such as power distributors and dispatchers and power systems operators may be classified as increased demand.

Green enhanced skill occupations might include power plant operators, electrical engineers, and mechanical engineers. This sector is likely to include many green new and emerging occupations, including those associated with designing wind farms, assessing wind capacity, technicians for wind operations, and installing or selling solar equipment.

On the other hand, the green construction sector will likely include many increased demand green occupations such as carpenters, electricians, cement masons and concrete finishers, and welders, cutters, solderers, and brazers. Several occupations may be classified as green enhanced skill occupations such as construction managers, civil engineers, and construction and building inspectors. ETA has not found much evidence of green new and emerging occupations in this sector.

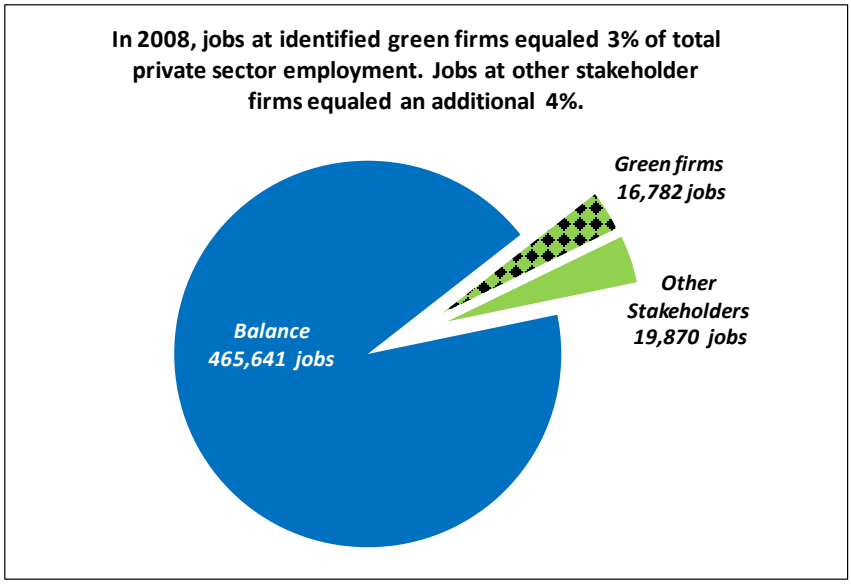
Firm - An alternative strategy for tracking trends in green employment is to develop a data set of employers doing green work. This strategy has its weaknesses. First, it assumes the existence of a "green firm"; in reality, many firms do a mix of green and non-green work. Next, it does not distinguish green jobs from others within a single firm.

The first step in identifying green firms was to consult published lists of firms actively engaged or interested in business activities related to energy efficiency and renewable energy; sources include: trade organizations (Maine Chapter of the U.S. Green Building Council and the Environmental and Energy Technology Council of Maine, Maine Association of Building Efficiency Professionals, Maine Wind Industry Alliance), energy-related meetings or training programs, and Efficiency Maine's qualified partners list. Media and key-word searches produced other likely stakeholder firms.

Though the list is neither exhaustive nor statistically representative of the range of firms engaged in green activities, these criteria identified firms with a demonstrated interest in renewable energy or energy efficiency sectors.

Next, each firm was checked against the Quarterly Census of Employment and Wages database (QCEW). Those that appeared in the QCEW database remained on the list of green stakeholders.

This criterion excluded all self-employed and other workers not covered by the Maine Employment Security Law.



This process produced a stakeholders list of 1,112 privately owned firms with average employment of 36,653, representing 7.3 percent of employment in 2008. Stakeholders may be firms currently involved in green activities or having an interest in future development. Though the stakeholder list may overstate the number of green jobs in Maine, it represents a group of firms likely to respond to a growing market for green products and services.

To further refine the list, each stakeholder firm was vetted on-line for confirmation that the firm either produced a product or provided a service related to energy efficiency or renewable energy. This final criterion reduced the stakeholder list to a green firm list.

The current green firm list has 523 firms with average employment of 16,782 in 2008, comprising 3.3 percent of private employment.

Industry	Number	2008 Average Employment
Green firms, private ownership	523	16,782
Natural Resources	1	*
Construction	137	3,285
Manufacturing	35	3,526
Wholesale	54	924
Retail	98	3,500
Transportation and Warehousing	1	*
Utilities	22	594
Information	1	*
Finance & Insurance	2	*
Real Estate, Rental & Leasing	1	*
Professional, Scientific & Technical Services	151	3,675
Management of Companies	2	*
Administrative and Support Services	4	52
Education Services firms	1	*
Health Care and Social Assistance	3	184
Other Services	10	224
* Non-disclosable		

Moving forward

Assessing current demand –The Maine Department of Labor, in consortium with seven other states, is pursuing an alternative means of measuring green jobs, by assessing current demand. Many observers have used the term "greening of jobs." The implications of that term are that the definition of green is not a static term and that the number of distinct industries and occupations considered green will continue to change. Building from work already done by other states, the U.S. Department of Labor, The PEW research group, and others, the definition of green jobs will be refined. From this definitional base an assessment of key green words and phrases will be developed through interactions with industry groups and others interested in the green economy. These key words and phrases will be matched against employers needs as measured by job postings.

Recently, the emergence of new data systems with flexible search capabilities offers new opportunities for gauging "real time" occupational demand. WANTED Analytics 2.0, a joint venture of Wanted Technologies and the Conference Board, permits retrieval of the most current information on hiring activity. Information is available for the entire nation, a local region, an occupation, or a company using job postings from multiple job boards as the source. This searchable database not only provides for the identification of detailed occupational titles (including those identified as green jobs; i.e., Solar Panel Installer, Wind Turbine Technician, etc.), but also provides access to job descriptions and ad content. The wealth of qualitative information can be accessed and analyzed using key word search to identify the knowledge, skills and abilities being sought by employers. Job titles and content identified in this manner may be readily cross-checked with occupational listings described above. This method will be used to better estimate the extent of actual demand for workers.

Beyond current job estimates, projecting job change-With the lack of a clear definition of green jobs and the inability of the current data programs to collect specific data needed, alternatives to traditional job projection methods are also underway. The consortium of eight states plans to combine short-term occupational projections, other traditional

Stetson I is the first phase of two wind turbine arrays planned for Stetson Mountain and surrounding ridges in northern Washington County. Stetson I consists of 38 turbines and is New England's largest operational wind farm. Project construction involved clearing 242 acres (87 percent temporarily) to install the turbines and associated meteorological towers, roads, power collection and transmission system and maintenance facility.

According to owner FirstWind, 350 people were directly engaged in construction. About $50 million of approximately $65 million spent for construction, engineering, and development services was spent in Maine, benefiting:

- 16 Maine consulting firms
- Nearly 100 Maine contractors and suppliers
- An additional 24 local businesses providing services to workers

The project was completed in early 2009 when the turbines began generating electricity. Now in commercial operation, a crew of four manages and maintains the turbines.

sources of data, and job vacancy data to project short-term employer demand. These projections are expected to reflect six- and twelve-month time frames.

These short-term projections are more likely to capture brief flares in green economic activity. For example, a renewable energy project such as a wind farm provides an immediate and significant boost in green jobs, but a smaller long-term job impact. Development of a wind farm requires spending millions of dollars for construction, engineering, and development services. Hundreds of workers are employed as a result, providing a variety of goods and services. However, upon completion only a few employees are needed to maintain and monitor the wind farm. Beyond the workers needed to maintain the wind farm, the longer-term impact of wind energy on Maine jobs will depend largely on how much of the industry supply chain is developed in-state. For example, will wind turbine blades be manufactured in Maine?

Also underway is the development of a model to project the demand for workers due to weatherization. Maine has been recognized for running one of the strongest weatherization programs in the country. Governor Baldacci has set a goal of weatherizing all Maine homes over the next twenty years.

Key to success of all these weatherization efforts is the availability of a skilled workforce capable of performing a mix of technical, engineering, and installation services in line with demand. The Center for Workforce Research and Information (CWRI) is tasked to project workforce requirements to meet furniture needs in the full spectrum of occupations. Ensuring an adequate supply of qualified workers to meet the needs for weatherization of Maine homes is an immediate challenge. To that end CWRI, in cooperation with Maine Housing, Efficiency Maine, and private energy consultants has developed a model designed to project workforce needs for Maine's weatherization efforts. Multiple sources were drawn on including the "Final Report of Investigation into Residential Energy Efficiency Workforce Needs" by Green Economy. Quantrix, a cutting-edge multidimensional business modeling and analytics software package, was used as the modeling software. A panel of experts helped shape the assumptions and model configuration.

Workforce projections for the weatherization program should be used with caution as the assumptions input to this model preliminary. An initial run of the model indicates that the number of full-time equivalent energy auditor jobs is expected to increase by 55 between 2010 and 2015. The number of jobs for weatherization technicians is projected to increase by 118.

Year	Homes		Jobs (FTE*)	
	Audited	Weatherized	Auditors	Installers
2010	14,835	5,815	65	168
2011	17,801	6,979	77	202
2012	20,445	8,014	89	232
2013	22,796	8,936	99	258
2014	24,888	9,756	108	280
2015	25,300	9,917	110	286
*Full-time equivalent.				

Long-term projections of green job growth will depend in part on data collection which captures green job taxonomy and then using this data to track local and regional trends. For example, renewable energy projects, above and beyond the immediate construction phase, will have a more enduring impact on jobs related to energy production and transmission. Within the energy efficiency sector, construction of new green buildings may have a growing impact on the need for skilled workers and be felt not only among those firms that are involved in the construction industry, but also among those firms that are involved in green design and firms that produce green building materials.

Conclusion

Counting the number of green jobs in Maine is problematic. Existing methods of estimating jobs, whether by industry or occupation, do not adequately capture green jobs.

Tracking employment in firms which have indicated involvement or interest in providing green services or goods is perhaps the best alternative currently. While this is not an absolute measurement of green jobs, it does provide an indication of the greening of the Maine economy.

During the next few months new methodologies to measure current demand for labor will be developed and tested. This should provide a measure of the labor needs of employers, particularly for new and emerging green occupations, which can be linked to workforce development.